JUL 5

Post-it® Fax Note	Date 7/7	# of pages ▶
To Doug Potter	From Jeff Tuhas	
Co./Dept.	Co.	
Phone #	Phone #	
Fax # 307-872-3876	Fax #	

6.5 Plume Visibility

One of two ways to measure the effects of air emissions on visibility is to determine the perceptibility of the plume at a Class I Area. The EPA's VISCREEN model is used to determine plume perceptibility using two criteria: plume perceptibility (delta E) and plume contrast. These parameters are calculated by VISCREEN for vistas looking inside the Class I Area and looking outside the Class I Area. For this analysis, these criteria are only assessed inside the Class I Area. The VISCREEN model was used with the following inputs:

812 tons per year particulate emissions,
Background Visual Range of 262 kilometers,
Source Observer distance of 130 kilometers,
Minimum Distance of 130 kilometers, and
Maximum Distance of 145 kilometers.

An initial Level One analysis (using worst-case meteorological conditions) did not show compliance with the screening criteria used by VISCREEN.

The five-year meteorological data set was analyzed to determine what meteorological conditions should be used in the Level Two analysis following the guidance in the EPA's Tutorial Package for the VISCREEN Model. In addition, as recommended in the Tutorial Package, stabilities were shifted one level less stable (i.e., D was changed to C) to account for the elevation change between the source and the Class I Area. The Level Two analysis did show compliance with screening criteria for visual impacts inside the Class I Area.

Doug,

This is the most recent files I could find. I'll QA it more tomorrow.

E:\SOLVAY\VISCREEN\VIS_SUM.DOC 04-30-97

Visual Effects Screening Analysis for
Source: Solvay
Class I Area: Bridger

*** User-selected Screening Scenario Results ***

Input Emissions for

Particulates	812.00	TON/YR
NOx (as NO2)	.00	TON/YR
Primary NO2	.00	TON/YR
Soot	.00	TON/YR
Primary SO4	.00	TON/YR

PARTICLE CHARACTERISTICS

	Density	Diameter
Primary Part.	2.5	6
Soot	2.0	1
Sulfate	1.5	4

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	262.00 km
Source-Observer Distance:	130.00 km
Min. Source-Class I Distance:	130.00 km
Max. Source-Class I Distance:	145.00 km
Plume-Source-Observer Angle:	11.25 degrees
Stability:	3
Wind Speed:	5.00 m/s

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	113.	145.0	55.	9.63	.051	.23	.001
SKY	140.	113.	145.0	55.	6.42	.008	.23	-.000
TERRAIN	10.	84.	130.0	84.	8.35	.068	.24	.001
TERRAIN	140.	84.	130.0	84.	5.82	.004	.24	.000

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	0.	1.0	169.	2.00	6.591*	.05	.088*
SKY	140.	0.	1.0	169.	2.00	.973	.05	-.018
TERRAIN	10.	0.	1.0	169.	2.00	3.378*	.05	.032
TERRAIN	140.	0.	1.0	169.	2.00	1.111	.05	.019

Visual Effects Screening Analysis for
Source: Solvay
Class I Area: Bridger

*** User-selected Screening Scenario Results ***

Input Emissions for

Particulates	812.00	TON/YR
NOx (as NO2)	.00	TON/YR
Primary NO2	.00	TON/YR
Soot	.00	TON/YR
Primary SO4	.00	TON/YR

PARTICLE CHARACTERISTICS

	Density	Diameter
Primary Part.	2.5	6
Soot	2.0	1
Sulfate	1.5	4

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	262.00 km
Source-Observer Distance:	130.00 km
Min. Source-Class I Distance:	130.00 km
Max. Source-Class I Distance:	145.00 km
Plume-Source-Observer Angle:	11.25 degrees
Stability: 3	
Wind Speed: 6.00 m/s	

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	113.	145.0	55.	9.63	.042	.23	.001
SKY	140.	113.	145.0	55.	6.42	.006	.23	-.000
TERRAIN	10.	84.	130.0	84.	8.35	.057	.24	.001
TERRAIN	140.	84.	130.0	84.	5.82	.004	.24	.000

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	0.	1.0	169.	2.00	5.592*	.05	.074*
SKY	140.	0.	1.0	169.	2.00	.821	.05	-.015
TERRAIN	10.	0.	1.0	169.	2.00	2.905*	.05	.027
TERRAIN	140.	0.	1.0	169.	2.00	.935	.05	.016

Visual Effects Screening Analysis for
Source: Solvay
Class I Area: Bridger

*** User-selected Screening Scenario Results ***

Input Emissions for

Particulates	812.00	TON/YR
NOx (as NO2)	.00	TON/YR
Primary NO2	.00	TON/YR
Soot	.00	TON/YR
Primary SO4	.00	TON/YR

PARTICLE CHARACTERISTICS

	Density	Diameter
Primary Part.	2.5	6
Soot	2.0	1
Sulfate	1.5	4

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	262.00 km
Source-Observer Distance:	130.00 km
Min. Source-Class I Distance:	130.00 km
Max. Source-Class I Distance:	145.00 km
Plume-Source-Observer Angle:	11.25 degrees
Stability:	4
Wind Speed:	5.00 m/s

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

Backgrnd	Theta	Azi	Distance	Alpha	Delta E Crit	Delta E Plume	Contrast Crit	Contrast Plume
SKY	10.	113.	145.0	55.	2.00	.516	.05	.011
SKY	140.	113.	145.0	55.	2.00	.077	.05	-.002
TERRAIN	10.	84.	130.0	84.	2.00	.656	.05	.006
TERRAIN	140.	84.	130.0	84.	2.00	.042	.05	.001

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE Exceeded

Backgrnd	Theta	Azi	Distance	Alpha	Delta E Crit	Delta E Plume	Contrast Crit	Contrast Plume
SKY	10.	0.	1.0	169.	2.28	11.695*	.05	.159*
SKY	140.	0.	1.0	169.	2.00	1.780	.05	-.033
TERRAIN	10.	0.	1.0	169.	2.15	5.606*	.05	.054*
TERRAIN	140.	0.	1.0	169.	2.00	2.047*	.05	.036

Visual Effects Screening Analysis for
Source: Solvay
Class I Area: Bridger

*** User-selected Screening Scenario Results ***

Input Emissions for

Particulates	812.00	TON/YR
NOx (as NO2)	.00	TON/YR
Primary NO2	.00	TON/YR
Soot	.00	TON/YR
Primary SO4	.00	TON/YR

PARTICLE CHARACTERISTICS

	Density	Diameter
Primary Part.	2.5	6
Soot	2.0	1
Sulfate	1.5	4

Transport Scenario Specifications:

Background Ozone:	.04	ppm
Background Visual Range:	262.00	km
Source-Observer Distance:	130.00	km
Min. Source-Class I Distance:	130.00	km
Max. Source-Class I Distance:	145.00	km
Plume-Source-Observer Angle:	11.25	degrees

Stability: 3
Wind Speed: 4.00 m/s

R E S U L T S

i d eed screening criteria

I I Area

A

Contrast Crit	Contrast Plume
.23	.001
.23	-.000
.24	.001
.24	.000

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE Exceeded

Backgrnd	Theta	Azi	Distance	Alpha	Delta E Crit	Delta E Plume	Contrast Crit	Contrast Plume
SKY	10.	0.	1.0	169.	2.00	8.022*	.05	.107*
SKY	140.	0.	1.0	169.	2.00	1.195	.05	-.022
TERRAIN	10.	0.	1.0	169.	2.00	4.033*	.05	.038
TERRAIN	140.	0.	1.0	169.	2.00	1.366	.05	.024